

18. The method according to claim 14 wherein the talc and microsilica are added separately to the thermoplastic resin.

19. The method according to claim 14 wherein the weight ratio of talc and microsilica is between 6:1 and 1:5.

20. The method of claim 16 wherein:
compounding is extruding;
the talc and microsilica are added to the thermoplastic resin as a mixture; and
the weight ratio of talc and microsilica is between 6:1 and 1:5.--

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REMARKS

Applicants have carefully considered the matters raised by the Examiner in the outstanding Office Action but remain of the opinion that patentable subject matter is present. Applicants respectfully request reconsideration of the Examiner's position based on the above amendments to the claims and the following remarks.

One of the novel aspects of the present invention is the discovery that the combination of talc and microsilica to a thermoplastic resin provides a thermoplastic resin product which has a high impact strength and a high stiffness. The addition of talc to a thermoplastic resin was known to improve the stiffness of the thermoplastic resin. This fact is brought out in the

specification at page 1, third paragraph. It was also known that the impact strength of the thermoplastic resin composition comprising talc and a thermoplastic resin was low. Trying to improve the impact strength by adding known impact modifiers to the thermoplastic resin and talc composition had been found to substantially reduce the stiffness of the resulting thermoplastic product, see page 1, paragraph 5, of the application.

Microsilica is known as an impact strength modifier, see page 2, first full paragraph.

What applicants found is that microsilica improved the impact strength of the thermoplastic resin while also maintaining the stiffness provided to the product from the talc. Thus, the present invention provides synergistic results in that the microsilica does not decrease the stiffness of the thermoplastic resin composition product and improves the impact strength of the product. All this can be seen from the data listed in the tables in the examples of the instant application.

Tables 2 and 3 provide the best examples of the synergism of the present invention. In Table 2, it can be seen that a 5% blend which comprises essentially 3% talc and 2% microsilica, the results are at least comparable to the 5% talc alone or the 5% microsilica alone.

Table 3 shows similar results in that the 10% blend of 1:1

talc to microsilica, i.e. 5% talc and 5% microsilica, gives results that are comparable to 10% talc in tensile strength and improved impact strength. Thus, it can be seen that the addition of microsilica does not cause a reduction in the tensile strength and provides impact strength.

Turning now to the Office Action, claims 1-7 had been rejected as being unpatentable over GB 2210882. This patent relates to a composition for lining a pipe and sewer and is basically an epoxy resin containing a cement slurry. The particulate fillers mentioned on page 6 in the specification are fillers for the cement composition and not for the epoxy resin. Microsilica is a well-known additive for cement and cement compositions. Furthermore, the '882 application does not specifically teach the combination of microsilica and talc in the amounts set forth in the claims, namely, adding a combination of talc and microsilica in a weight ratio of 15:1 to 1:15 to a thermoplastic resin. Thus, the '882 reference is a very broad teaching of using an epoxy resin along with various hardeners such as cement wherein the hardener can contain inorganic fillers, however, the '882 reference clearly does not teach the specific combination of the use of microsilica and talc together with an epoxy resin. Respectfully, the present invention is patentable over the '882 reference.

Turning to the formal matters raised by the Examiner in the outstanding Office Action, claim 3 had been objected to in that the word "to" was used instead of --into-- on line 6. Claim 3 has been

amended herein to change "to" to --into--. Claim 5 had been objected to as being improperly dependent upon claim 2. Claim 5 has been amended herein to be dependent upon claim 3 as suggested by the Examiner.

Claims 1, 3 and 6 had been rejected under 35 USC 112, second paragraph, for using the exemplary term "particularly". Claims 1, 3 and 6 have been amended herein to remove the objection to the language and add as subordinate claims this exemplary language. See claims 8 and 9.

In reviewing the claims, additional amendments have been made herein. Specifically, claims 1-7 have been amended into more conventional U.S. terminology. Specifically, in claim 1, the introductory portion of the claim was amended to recite a thermoplastic resin composition which brings it more in line with the remaining portion of the claim. Also, the conventional U.S. transitional phrase "comprising" was employed. In claim 2, the introductory portion of the claim and the transitional phrase have been amended to use more conventional terminology. In claim 3, the step for the method has been more positively recited. Also, the objected to language of product or compound has been amended to composition. Claims 4-7 have also been amended to use more conventional terminology.

Newly added claims 8 and 9 simply recite that the thermoplastic resin is selected from the group consisting of

polyolefines, polyvinylchloride, and polyamides. This language is taken from the preamble of claims 1 and 3. Claim 10 recites the preferred ratio of talc to microsilica and finds support in the specification on page 3, last full paragraph. Claim 11 is simply claim 2 which has been made dependent upon claim 8. Claims 12 and 13 mirror claims 4 and 5 but are dependent upon claim 9. Claims 14-20 are directed to making a thermoplastic resin product and recite the step of adding the talc and microsilica to the thermoplastic resin and then compounding the mixture to form a thermoplastic resin product. The step of compounding is recited in the specification at page 3, fifth paragraph. Claim 15 finds support in this paragraph in that it recites that the compounding is extrusion, calendering, or injection molding. Claim 16 recites the specific thermoplastic resin composition as recited in the previous claims. Claims 17 and 18 mirror claims 4 and 5 but are dependent upon claim 14. Claim 19 recites the preferred range for talc and microsilica and mirrors claim 2 but is dependent upon claim 14. Finally, claim 20 recites that the compounding is extruding, the talc and microsilica are added to the thermoplastic as a mixture, and that any preferred weight ratio of talc and microsilica, all of which find support in the previous claims and in the specification on page 3. The added claims and the amendments made to the claims herein add no new matter.

In reviewing the specification, a typographical error was noted on page 3, fifth paragraph. The typographical error "termoplastic" as opposed to --thermoplastic-- has been corrected

herein.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance and such action is respectfully requested. Should any fees or extensions of time be necessary in order to maintain this application in pending condition, appropriate requests are hereby made and authorization given to debit account #02-2275.

Respectfully submitted,

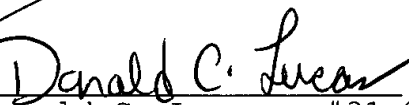
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A handwritten signature in cursive script, reading "Donald C. Lucas". A long, sweeping horizontal line extends from the end of the signature to the left, crossing over the word "By".

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According to a first aspect, the present invention thus relates to thermoplastic resin compositions, particularly polyolefines, polyvinylchloride and polyamide, characterized in that the thermoplastic resin compositions contains between 3 and 400 % by weight of filler based on the weight of the resin, said filler comprising talc and microsilica where the weight ratio between talc and microsilica is between 15:1 and 1:15.

According to a preferred embodiment the weight ratio of talc and microsilica is between 6:1 and 1:5.

According to a second aspect the present invention relates to a method for the production of thermoplastic resin composition, particularly polyolefines, polyvinylchloride and polyamide, which method being characterized in that talc and microsilica is added to thermoplastic resin in a total amount between 3 and 400 % by weight based on the weight of thermoplastic resin and where the weight ratio between talc and microsilica is kept between 15:1 and 1:15, whereafter the mixture is formed into a thermoplastic resin product or compound.

According to a preferred embodiment of the method of the present invention talc and microsilica are added to the thermoplastic resin as a mixture of talc and microsilica.

The compounding of the ^{Thermoplastic}thermoplastic resin can be done using conventional processes like extrusion, calendering, injection moulding and others.

According to a third aspect, the present invention relates to a filler blend for use in thermoplastic resins, particularly polyolefines, polyvinylchloride and polyamide, wherein the filler blend contains talc and microsilica in a weight ratio between 15:1 and 1:15, and particularly between 6:1 and 1:5.

CLAIMS

A thermoplastic resin composition comprising a thermoplastic resin,

- 5 1. A thermoplastic resins compositions, particularly polyolefines, polyvinylchloride and polyamide, characterized in that the thermoplastic resin compositions contain between 3 and 400 % by weight of filler based on the weight of the resin, said filler comprising talc and microsilica where the weight ratio between talc and microsilica is between
10 15:1 and 1:15.

The thermoplastic resin composition (wherein)
2. A thermoplastic resins according to claim 1, characterized in that the weight ratio of talc and microsilica is between 6:1 and 1:5.

- 15 3. A method for ^athe production of ^athermoplastic resin composition, particularly polyolefines, polyvinylchloride and polyamide, characterized in that ^(comprising adding) talc and microsilica ^ais added to ^athe thermoplastic resin in a total amount between 3 and 400 % by weight based on the weight of thermoplastic resin and where the weight ratio between talc and microsilica is
20 kept between 15:1 and 1:15, whereafter the mixture is formed ^{into} ^ato a thermoplastic resin ^{composition} product or compound.

- ^{The}
4. ^aA method according to claim 3, ^{wherein the} characterized in that talc and microsilica are added to the thermoplastic resin as a mixture of talc and
25 microsilica.

- ^{The}
5. ^aA method according to claim ^{3,} ^{wherein the} characterized in that talc and microsilica are added separately to the thermoplastic resin.

- 30 6. A filler blend for use in thermoplastic resin ^{comprising} compositions particularly polyolefines, polyvinylchloride and polyamide, characterized in

that the filler blend contains] talc and microsilica in a weight ratio between 15:1 and 1:15.

7. ^{The} ~~A~~ filler blend according to claim 6, ^{wherein} ~~characterized in that~~ the
5 filler blend contains talc and microsilica in a weight ratio between 6:1 and 1:5.